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Thinking Patterns of Primary School Children Suffering from the Cerebral Palsy

Alla Alexandrovna Tvardovskaya

Kazan Federal University, Institute of Psychology and Education,
ul. Kremlevskaya, 18, 420008 Kazan, Russia

Abstract: The present work contains the results of comparative psychological and pedagogical study of thinking patterns of normal primary school children and of those suffering from the cerebral palsy. Some of the characteristics of thinking based on clinical forms of disturbance, the severity of cerebral palsy are described here.

Key words: Primary school age · Cerebral palsy · Thinking

INTRODUCTION

In recent years there has been quite a large number of comparative studies, which show characteristics of thinking in different groups of children with developmental disabilities. In the course of these studies it was found that all children with developmental disabilities have varying degrees of deviations in the development of thinking patterns [1,2,5,9].

Among all categories of children with developmental disorders a number of children with disabilities of the musculoskeletal system has significantly increased. [4] For a long time, children from this category in Russia received only medical care and only in the middle of the XX century speech therapists of our country, as well as speech pathologists and psychologists focused on the problem of cognitive and language development of children suffering from cerebral palsy. Analysis of clinical, neuropsychological and psychoeducational aspects of cerebral palsy (CP) shows that this kind of developmental disability includes movement disorders accompanied by intellectual and speech disorders of various severity. [3,7,10]

MATERIALS AND METHODS

The study involved 129 children aged from 7 to 10 years. 60 of them were students of general education schools and 69 of primary school children - students of special (correctional) educational institutions for children with disorders of the musculoskeletal system. Normally developing children were included in the control group to compare outcomes.

We are now considering in more detail an experimental group of children with cerebral palsy. Problems of motor development in all children included in the study were detected in the first year of life. They were diagnosed as "cerebral palsy". The gender distribution of children enrolled in the experimental was 40 (58%) boys and 29 (42%) girls.

In accordance with the classification of clinical forms of cerebral palsy proposed by Semenova K.A. (1977, 1979, 1999) children of the experimental group were distributed as follows: spastic diplegia - 37 (53.6%), right-sided hemiparesis - 9 (13%), left-sided hemiparesis - 13 (18.8%) and hyperkinetic form of cerebral palsy - 10 (14.6%). [8]

Analysis of these data confirms the fact that spastic diplegia is the most common form of cerebral palsy. This is spastic diplegia that represents the largest number of children in our sample. Also 7 surveyed children have epileptic syndrome in their last medical histories.

Describing study participants according to the severity of motor pathology, the light stage of the pathology is present in 32 children (46%), the medium stage of the pathology is present in 26 children (38%) and the heavy stage of the pathology is present in 11 children (16%). In the differentiation of children by severity of motor disorders and self-service state we followed the criteria proposed by Levchenko I.Y. and Prihodko O.G. [6].

Corresponding Author: Tvardovskaya, Kazan Federal University,
Institute of Psychology and Education ul, Kremlevskaya, 18, 420008 Kazan, Russia.

Schoolchildren with the light stage of the motor pathology were able to move short distances independently. They were able to change the posture of the body easily and used different modes of transportation (walking, running). Insufficient co-ordination, simultaneity, accuracy and speed of movement were also noted. There are difficulties in the preservation of the static equilibrium posture and when moving. The following actions cause difficulties: jumping, joint movements of different body parts, actions with objects. Handling functions of hands are limited slightly. Children are available for hand catch to a greater or lesser extent, however graphic skills are below the age norms for the leading hand. Children can master the life skills of personal hygiene, but face difficulties when dressing narrow and tight clothes.

In children with medium severity of motor development pathology there are independent self-movement skills using special orthopedic devices (crutches, sticks, walkers). They can quite quickly and successfully change the posture of the body, moving around the room by crawling or walking. Schoolchildren need help of adults when going up and down stairs, as well to overcome obstacles. Manipulative activity is possible, but is limited because of the involvement of hands in maintaining equilibrium posture of the body.

Those children who are unable to move even with the use of special tools are included in the group of children with heavy stage of the motor development disorders. They have formed skills of holding the head, turning and sitting (in some cases posture has enforced character), some can move by crawling. Children are moved in and out of the class only with the help of adults. Due to the severe impairment of hands they cannot master self-management skills.

In addition to motor disorders children with cerebral palsy also develop speech disorders. Analysis of speech cards and additional documentation of speech pathologist showed that the main forms of speech pathology in such children are spastic-paretic and rare spastic-hyperkinetic forms of dysarthria (63%) or sensory-motor alalia (7%).

According to the level of their mental development, the children suffering from the cerebral palsy constitute a diverse group. Intellectual development of children was ranged from “preserved level” to “mental retardation”. Thus, there were 30 (42%) children with normal level of intellectual development and 39 (58%) children with mental retardation. Younger schoolchildren had predominantly preserved level of intellectual development in the following proportion: 28% (19 children) with spastic diplegia, 13% (9 children) with hemiparetic form and 4% (3 children) with hyperkinetic form. Mental retardation of cerebral organic genesis was observed in 26% (18 children) with spastic diplegia, in 19% (13 children) with hemiparetic form and in 10% (7 children) with hyperkinetic form.

In order to identify features of children’s mental activity and subsequent evaluation of assigned tests, we have conducted a pilot study that resulted in the development of a diagnostic program, consisting of four blocks.

To assess motor development in children with cerebral palsy, we used the parameters of assessment of seating and standing skills developed by Simonova T.N. and Simonov V.G. (2008). We’ve also evaluated functional capabilities of the right and left hand (by Pavlovskaya N.T., 2006), allocated the guiding hand and the degree of participation of the affected arm in self-management and educational activities. On assessing language development, we studied the degree of intelligibility and communicative function of speech based on the results of the whole study. The third block in the diagnosis was the assessment of prerequisites for the formation of mental activity, which includes the following procedures: diagnosis of spatial representations (Titova O.V.), evaluation of the ability to design subjects from counting sticks following verbal instructions (Konovalenko S.V.) and evaluation of graphic skills (Bender’s Gestalt test). The fourth block of the diagnostic program is aimed at mental activity itself in the unity of its components: the operational one (procedure "Split Pictures”, classification tests, comparison tests (by Ul’enkova U.V.) method "exclusion of the fourth unnecessary object"), motivational one (the availability and stability of interest to the task, performance during the task, nature of the activities (purposefulness and activity) and regulatory one (complete understanding of the task, independence when performing the task, characteristics of activity regulation). During the overall evaluation of the results of thinking patterns in children we have also considered a number of common diagnostic parameters proposed Levchenko I.Y., Kiseleva N.A. (2006) [6].

Main Part: As the results of the study show, schoolchildren were able to cope with the proposed diagnostic tasks at different levels. Four levels of thinking pattern were identified according to the certain estimating parameters. These levels were set for each child in accordance with an average score for the performance of

all experimental tasks and qualitative assessment made in the course of the activities of the schoolchild. Prevailing level of thinking pattern in normally developing schoolchildren was the first and second level (60 children). Most children with cerebral palsy performed tasks of diagnostic program at the II and III level (56 children), at more rarely level IV-13 children.

Schoolchildren assigned to the level I of mental activity (92-123 points) were able to contact with an experimenter easily and quickly, showed interest in cooperation, actively communicate. The interest in proposed tasks was permanent and considerable during the survey. Mental operations selected by child are performed correctly, equally to the focus problem. Upon presentation of instructions and materials there's hyperactivity and purposefulness. Children show a high degree of methods of analysis and synthesis of the facility where synthesis is based on the exarticulation of elements complex, while the analysis involves synthesizing the totality of signs. When performing classification, task division and subsequent unification of objects and phenomena in the group are made on their own. Comparing images and notions the child is able to name over 12 signs of similarities and differences. The task for exclusion of unnecessary was completed and the general concept was named independently. These children are characterized by a conscious desire to the correct result, an independent decision of the experimental tasks, use of rational methods of mental activity, which led to a considerable reduction during performing tasks. Among the schoolchildren assigned to the level I of mental activity there were no children with cerebral palsy, while the number of normally developing children of the same age assigned to the level I was 37.2% (48 subjects).

In the group of schoolchildren assigned to the level II of mental activity (from 61 to 91 points) the task was completed by 9.3% (12 children) of normally developing students and by 14.8% (19 children) suffering from the cerebral palsy without mental retardation and by 1.7% (2 children) with cerebral palsy and mental retardation. Typical peculiarity at this level was the need of students to use the help of an adult. An interest to tasks is expressed, but missed due to failures, moderate capacity for work and lack of concentration. Schoolchildren assigned to the level II proceeded to solve the proposed problem, but unlike students of the first group they needed help in organization and supervisory by an experimenter. Task instructions are understood by the child, but some of instructions are completely understood only in the process of doing the task. Because of this reason the observed activity and purposefulness are dramatically lowered to the middle or end of the task. Because of this activity and focus sharply reduced. Child in the survey prefers visually graphic tasks. The child understands verbal tasks, can focus on them, but can control the progress only with the help of an adult who helps him by eliciting questions. The child comments his actions by speech statements. The pace of activity is slow but even. Classification tasks are performed correctly, but they are corrected on the fly. Comparison of objects is performed with rely on visible and noticeable symptoms, however the child selects more differences than similarities. There are errors in the exclusion of fourth unnecessary subject. On performing the tasks there's a minimum number of errors, they can't be always seen by the children themselves and an investigator sometimes should clarify about actions while performing tasks.

In the group of schoolchildren assigned to the level III of mental activity (from 31 to 60 points) the task was completed by 8.5% (11 children) with cerebral palsy without mental retardation and by 18.6% (24 children) with cerebral palsy and mental retardation. Beginning to implement the task, the children of this group were not always able to perform it completely facing many difficulties. They lost interest in the task being performed and diverted from the course of its implementation. It was easy to contact children of this group, they showed an interest in external communication, but were apathetic to the content of the task. Capacity for work during the execution of the task was unstable, they couldn't always complete the work on the task and moved to the new one. Schoolchildren's behavior was characterized by impulsivity. There was neither systematic nature in their activity nor organization. Unreasonable methods were used. Instead of analyzing conditions of the problem and searching for adequate ways to solve the problem such children reproduced the most familiar way of doing the task. However this pattern didn't always deal with the conditions of the task, thereby replacing the difficult task by an easier one. Performing the experimental tasks schoolchildren couldn't isolate an external, conspicuous feature of the object and gave it an overall significance not correlating with other signs. In this case, the analysis was limited to the isolation of one element, while part-time, one-sided synthesis led to an erroneous answer. When performing the task, avoidance of difficulties in solving the problem associated with the operation of the classification was typical for these children. They needed clarifying questions to perform any classification. While performing the task for comparison, children didn't pay attention to the subtle but important details. Subjects of

this group didn't always rely on the important details on the basis of which they made the conclusion about the similarities or differences. Characteristic of experimental task solution was that its performance was difficult for schoolchildren with respect to verbal-logical point, while the visual presentation and help of an experimenter allowed children to cope with the tasks successfully. Self-control in completing the task was insufficient but only in respect to the part of instruction. The child himself can't notice his errors and his speech performs only the state function.

In the group of schoolchildren assigned to the level IV of mental activity (0-30 points) the task was completed only by 10% (13 children) with cerebral palsy and mental retardation. Children were able to establish contact with psychologist easily, but it is unstable or has formal, superficial nature. Children often found it difficult to understand instructions for the task, impossibility to keep in mind the task itself. Schoolchildren were interested in the presented material, began to perform the task willingly, but their interest waned with the first difficulties, failures or experimenter comments. Nonverbal tasks were of the great interest. One can also note the inertia of thinking activity in tasks: the method of solving the problem was accompanied by "seizing", regardless of its conditions, as well as persistent stereotypical actions and repeatability of errors of the same type. Children of this group were not looking for the right decision and preferred to check the first variant of the answer. Children mainly used irrational and impulsive modes of action and included random selection of answers. When performing analytical-synthetic activity, the child can't mentally disjoint images, doesn't analyze the desired features, can't unite them in a single unit in accordance with the task and remembers only one more or less appropriate word similar to the right object. When performing classification of objects, the child couldn't get away from casual and secondary signs of objects, phenomena and required to get explanation by psychologist to perform the tasks successfully. Tasks for general concepts are also closely linked to the character of verbal material. Children found better and more successful general conclusion to those concepts with which they faced more common in everyday life. They needed extensive tutorial help of the experimenter during performing the task to exclude unnecessary objects. Throughout the whole survey the child couldn't notice the errors himself. A specific visual-effective assistance of an adult was needed to perform all or part of the required task correctly. Speech narration while performing tasks was missing or did not apply to the actions being performed.

CONCLUSIONS

The study of the characteristics of thinking patterns and its prerequisites in primary schoolchildren with cerebral palsy showed the originality of its development in cerebral palsy: typical peculiarity of thinking pattern in primary school children with cerebral palsy is the unevenness and disproportionality of forming thought and its main characteristics. The severity and extent of underdevelopment of thinking is not defined only by a form of cerebral palsy, but also depends on the lesion side and severity of motor disorders and the organization of a special child support. Comparative study of the characteristics of thinking patterns in normal younger schoolboys and those with the cerebral palsy allows us to conclude that children with cerebral palsy are behind the normal ones in mental development. Children with cerebral palsy exhibit a number of features of the thinking pattern due to its uneven development and disproportionately of its basic forms.

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